

SOME fifty years ago Ampère stated his belief in the existence of molecular electric currents permanently flowing in bodies, and he applied this hypothesis to the explanation of the reciprocal action between movable conductors through which galvanic currents are passing and permanent magnets. According to Ampère a permanent magnet contains, in proportion to its strength, a larger or smaller number of molecular currents of the same direction, each of which behaves like a small molecular magnet. In pursuance of this theory, Herr Zoellner has lately made a series of investigations and has recorded the results of his experiments in a paper read before the Royal Saxon Society of Sciences at Leipzig during the past year. With regard to the constitution of material molecules Herr Zoellner expresses his opinion "that each material molecule of a body consists of a conglomeration of (Ampère's) molecular currents of any direction, with a certain quantity of freely movable electric particles, which, under the influence of electrostatic or electrodynamic induction forces, execute such motions or groupings as are determined by Weber's law of electric reciprocal action." It is but fair to state that Weber's views on this subject were identical, and he stated them as early as in 1851 in his explanation of diamagnetism. Zoellner makes a whole series of deductions from this theory, all of which agree with observed phenomena and laws found in various domains of physical science.

THE Rev. T. R. R. Stebbing sends us an interesting letter on the true origin and correct pronunciation of the name *Antedon*, which we regret we have not space to print in full. As the result of careful inquiry, Mr. Stebbing concludes that the name is undoubtedly feminine, that the middle syllable should be pronounced long, and that the aspirate which de Fréminville dropped ought to be restored to the spelling. "If, then, we were to adopt the compromise suggested in Mr. Herbert Carpenter's important letter (vol. xv. p. 197), we should have to write, instead of either *Comatula rosacea* or *Antedon rosaceus*, the trinomial, *Comatula (anthenon) rosacea*. To sanction such an innovation as Mr. Carpenter proposes, no doubt some general agreement would be required, and the same general agreement might be usefully employed in sanctioning a statute of limitations against the revival of obsolete names, and to insure the publication of new scientific names in one or other of a very limited number of chronicles. Some international science congress of the future may perhaps achieve the requisite legislation."

THE *Journal* of the Society of Arts for February 16 contains a useful paper by Dr. R. J. Mann, on "Recent Explorations of the Lake Systems of Central Africa."

WE notice an important German work, by the Bernese Professor, Dr. Emmert, on the diseases of the eye, occasioned by various professions, and especially by the vicious arrangements in schools. An inquiry made by the learned Professor in the cantons of Berne, Solothurn, and Neuchâtel proves that an increasing myopia is the fate of all scholars, and that at the age of twenty years there are very few of them who are not afflicted with this disease. Various hints by the author as to improved arrangements to be adopted in schools deserve the attention of school boards.

A RECENT subscriber will find an account of Siemens' Bathometer in NATURE, March 30, 1876 (vol. xiii. p. 431).

THE additions to the Zoological Society's Gardens during the past week include two Pennant's Parrakeets (*Platyercus pennanti*) from New South Wales, presented by Mr. E. Sargent; an Anaconda (*Eunectes murinus*), a Crested Curassow (*Crax alector*), and two Green-billed Curassows (*C. viridirostris*) from South America; two Feline Dourocoulis (*Nyctipithecus felinus*) from South Brazil; two Cariamias (*Cariama cristata*), from South America, purchased.

## SOCIETIES AND ACADEMIES

LONDON

Royal Astronomical Society, February 9.—Annual general meeting.—William Huggins, D.C.L., president, in the chair. The following gentlemen—A. Mason Worthington, B.A., John Sidney White, and George Francis Hardy, were elected fellows of the Society. The annual report of the society showed that the number of Fellows had been increased during the past year, and that the society's library had been enriched by several important presents of books and manuscripts. Ten minor planets have been discovered in the course of last year, six of them in America, and four in France. In solar physics Prof. Tacchini has made an interesting investigation as to the relative height of solar prominences at different times of the sun-spot period. Prof. Young has determined the rate of the solar rotation by means of the displacement of the dark lines in the spectrum of the sun's limb. He has also proved that the 1474 line is double, and that the two components are of unequal strength; the coronal line corresponds to the stronger of the two, whilst the other is one of the faint lines in the spectrum of iron. Mr. Huggins' photographs of the spectra of stars were also referred to, and a short account was given of the observations of the new star in Cygnus, which was discovered by Dr. Schmidt, at Athens, on November 24, 1876. Its spectrum gives several bright lines, amongst which are three of the hydrogen lines, C being the brightest of all, the sodium line D, or the chromosphere line near D, the magnesium lines  $\delta$ , and the coronal line 1474. The reduction of the observations of the transit of Venus has been proceeding continuously at the Greenwich Observatory, under the direction of Capt. Tupman. All the observations with transit instruments at the various stations for local time and longitudes of Honolulu and Rodriguez by the observations of the moon in zenith distance have been completely reduced. An idea of the magnitude of the undertaking may be formed when it is stated that these two last calculations required the use of three millions of figures. The Report having been adopted, the Society proceeded to the election of Officers for the ensuing year, and the following gentlemen were elected: As President, William Huggins, F.R.S. As Vice-Presidents: J. C. Adams, F.R.S., Lowndean Professor of Astronomy, Cambridge; Sir G. B. Airy, K.C.B., F.R.S., Astronomer Royal; Arthur Cayley, F.R.S., Sadlerian Professor of Geometry, Cambridge; Edwin Dunkin, F.R.S. As Treasurer, Samuel Charles Whitbread, F.R.S. As Secretaries: J. W. Lee Glaisher, F.R.S.; A. Cowper Ranyard, M.A. As Foreign Secretary, Lord Lindsay, M.P. As Council: John Brett, Esq.; W. H. M. Christie, M.A. Warren De La Rue, F.R.S.; J. R. Hind, F.R.S., Superintendent of the *Nautical Almanac*; E. B. Knobel; George Knott; William Lassell, F.R.S.; E. Neison; Capt. Wm. Noble; Rev. S. J. Perry, F.R.S.; Earl of Rosse, F.R.S.; Capt. G. L. Tupman, R.M.A.

Geological Society, January 24.—Prof. P. Martin Duncan, M.B., F.R.S., president, in the chair.—George Barrow, William Heerlein Lindley, and Joseph Samuel Martin, were elected Fellows of the Society.—The following communications were read:—Note on the question of the glacial or volcanic origin of the Talchir boulder-bed of India and the Karoo boulder-bed of South Africa, by H. F. Blanford, F.G.S. The author, referring to a doubt expressed by the President in a paper on Australian tertiary corals as to the glacial origin of the Talchir boulder-bed, indicated that the hypothesis of its formation by the action of local glaciers under present climatal conditions would require the elevation of the whole region to the extent of 14,000 or 15,000 feet, and the assumption that the denudation of this great mountain mass was so moderate that large tracts of the ancient surface are still preserved at levels now only a few hundred feet above the sea. This the author regarded as very improbable. He assumed that the President, rejecting the evidence adduced by various writers in favour of the glacial origin of the Talchir and Karoo boulder-beds, was inclined to fall back upon the notion of their being of volcanic origin, and quoted a letter from Mr. King, who had described the Talchir rocks of Kámáram as trappean, in which that gentleman stated that the rocks so interpreted by him prove to be dark green and brownish mudstone. He cited further evidence of like nature, and concluded that the ascription of a volcanic origin to these boulder-beds was probably in all cases due to similar misinterpretations.—On British cretaceous patelloid gasteropoda, by John Starkie Gardner, F.G.S. In this

paper the author commenced by a general statement as to the classification of the forms to be described in it, which he referred to the families Patellidæ, Fissurellidæ, Calyptræidæ, and Capulidæ. He noticed thirty species, which are mostly of rare occurrence, and nineteen of these were described as new. Four genera were indicated as new to the Cretaceous series, and one as new to the Cretaceous in England. The new species were *Acmæa formosa* and *plana*, *Helcion Meyeri*, *Anisomyon vectis*, *Scurria calyptræiformis* and *depressa*, *Emarginula puncturella*, *divisiensis*, *ancistra*, *Meyeri*, and *unicostata*, *Puncturella antiqua*, *Calyptræa concentrica*, *Crepidula chamaeformis*, *Crucibulum giganteum*, *Pileopsis neocomiensis*, *dubius* and *Seeleyi*, and *Hippomyx Dixoni*. Most of the Patellidæ were from the Neocomian, and the majority of the Fissurellidæ from the Upper Greensand; the species of the other two families were scattered through the series. The author referred to the indications of depth of deposit and other conditions furnished by these Mollusca, and also to the resemblance presented by many of them to certain bivalves common in the same rocks, which he regarded as a sort of mimicry.—Observations on remains of the mammoth and other mammals from Northern Spain, by A. Leith Adams, F.R.S.—The remains noticed in this paper were obtained by MM. O'Reilly and Sullivan in a cavern discovered at about twelve metres from the surface, in the valley of Udias, near Santander, by a boring made through limestone in search of calamine. They were found close to a mound of soil which had fallen down a funnel at one end of the cavity, and more or less buried in a bed of calamine which covered the floor. The cavern was evidently an enlarged joint or rock-fissure, into which the entire carcasses, or else the living animals, had been precipitated from time to time. The author had identified among these remains numerous portions, including teeth of *Elephas primigenius*, which is important as furnishing the first instance of the occurrence of that animal in Spain. He also recorded *Bos primigenius* and *Cervus elaphus* (?), and stated that MM. O'Reilly and Sullivan mention a long curved tooth which he thought might be a canine of Hippopotamus.

Chemical Society, February 15.—Dr. Gilbert, F.R.S., vice-president, in the chair.—Dr. Dupré, F.R.S., read a paper on the estimation of urea by means of hypobromite, in which he described a new form of apparatus and certain modifications in details to facilitate the working of Russell and West's process. The other communications were on a new carbometer for the estimation of carbonic anhydride, by Mr. S. T. Pruett and Dr. G. Jones, being a modification of Scheibler's "calcmeter."—On the influence exerted by ammonium sulphide in preventing the action of various solutions on copper, by Mr. F. W. Shaw and Dr. P. Carnelly.—An experimental inquiry as to the changes which occur in the composition of waters from wells near the sea, by Mr. W. H. Watson.—On the solvent action of various saline solutions upon lead, by Mr. M. M. P. Muir.—Derivatives of Di-sobutyl, by Mr. W. Carleton-Williams, and notes on madder-colouring matters, by Dr. E. Schunck and Dr. H. Roemer.

## STOCKHOLM

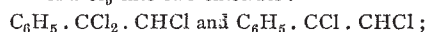
Academy of Sciences, October 11, 1876.—Baron Fock gave an account of a report by O. Nylander, assistant at the Academy of Agriculture, of a journey he had undertaken with the Letterstedt grant for the purpose of studying the industries associated with agriculture.—Prof. Torell also gave an account of a report by Edward Erdman, the geologist, of a tour he had made, with Government assistance, in Central Europe in 1875.—Prof. Smith gave a short account of the expedition to North-western Russia and the region round the White Sea, undertaken by Lieut. H. Sandeberg last summer.—Prof. Stål stated that the Vydler collections had been bought for the natural history department of the Riks Museum, through the liberal contributions of private persons, and gave a short account of their contents.—General-director Berlin communicated the result of the latest analyses by Valler of the mineral water at Porla, and Prof. Nordenskjöld gave a full and interesting narrative of his last expedition from Tromsø to Jenissei.—The following communications were received:—On the course of the alteration which a surface undergoes when it is bent, by Prof. Daug.—On compounds of cyanide of mercury with chlorides of the earthy metals, by J. E. Ahlén.

November 8, 1876.—Herr Edlund communicated the results of his examination of the galvanic currents which are caused by the motion of fluid bodies.—Prof. Nordenskjöld exhibited pieces of a mammoth or fossil rhinoceros hide, found last summer near the confluence of the Mesenkin with the Jenissei, and several meteor-

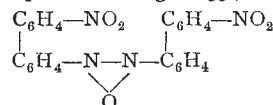
ites which fell at Stålldalen, in Westmanland, on the 28th of last June, and gave an account of the nature of the meteorites in question.—Herr Gylden exhibited a calculating machine constructed by Engineer Pettersson for the purpose of adding, subtracting, multiplying, and dividing, and gave an account of a communication by Prof. T. N. Thiele, of Copenhagen, entitled, "Some geometrical propositions concerning a problem in theoretical astronomy."—The following papers were communicated: A new species of the family Portunidae from the Scandinavian coast, by Docent Carl Bovallius; Communication from Upsala Chemical Laboratory, 20, on *g* (gamma) dichloronaphthalene and bromo-chloronaphthalene, by Prof. P. T. Cleve; Remarks on Dr. Bioren de Haans Tables d'intégrales définies (Amsterdam, 1858), by Lektor Lindman, member of the Academy; and Researches on the cooling of bodies, by Prof. G. R. Dahlander.

## BERLIN

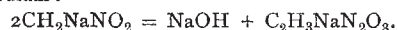
German Chemical Society, January 29.—A. W. Hofmann, vice-president, in the chair.—W. Beetz claims priority for observing the disengagement of hydrogen at both poles of a battery (as lately described by Elsässer).—W. Bornemann published observations on the solubility of chloride of iodine, and R. Ulbricht some on the determination of water and of sugar in wine. The latter chemist gives warning of a fraud by which glass weights are sold instead of ones made from rock crystal.—R. Dyckerhoff has transformed monochloro-acetophenone,  $C_6H_5-CO-CH_2Cl$ , by the action of  $PCl_5$  into two chlorides:



—V. Meyer, T. Barbieri, and F. Forster by joint and elaborate researches refute the pretended observation of Linnemann and Zotta that normal butylamine and nitrous acid yield isobutylic alcohol. The reaction only yields normal primary butylic alcohol, normal butylene, and normal secondary butylic alcohol, but no isobutylic alcohol.—H. Wald has transformed paradinitro-diphenyl by the action of sodium-amalgam into paradinitro-azoxy-diphenyl, a crystalline powder melting at  $255^\circ$ , and soluble

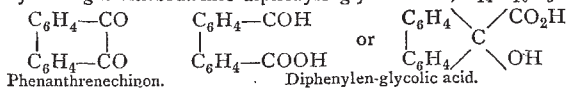


in aniline, but not in alcohol, ether, or chloroform, and yielding benzidine by further reduction with tin and hydrochloric acid. Isodinitrodiphenyl and sodium amalgam yield dinitro-azodiphenyl,  $(C_6H_4NO_2-C_6H_4N)_2$ , a yellow powder melting at  $187^\circ$ .—C. Kimich published researches on methazonic acid, the sodium-salt of which is engendered by the action of heat on nitro-methan-sodium:—

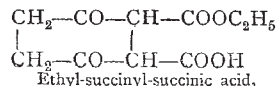


This salt with nitrate of diazobenzol, yields red crystals of a mixed azo-compound,  $C_6H_5N_2 \cdot C_2H_3N_2O_3$  (azonitromethaphenyl), in which two atoms of hydrogen can be replaced by metals. Nitrate of diazotoluol gives a corresponding compound.

—G. Burkhardt has transformed amidoterephthalic into oxytere-phthalic acid (with nitrous acid), a powder giving a crystallised barium salt and methylic ether. Hydrochloric acid transforms it into oxybenzoic (not salicylic) acid.—A. Baeyer has studied amidophthalic acid and its well-crystallised ethylic ether, which, with nitrous acid, yields an ill-defined oily oxyphthalic acid. The same chemist has transformed chloride of phthalyl into phthalic aldehyde by treating it with hydriodic acid and phosphorus. With potash it yields a new acid not yet investigated. The same chemist has transformed phenanthrenequinone,  $C_{14}H_8O_2$ , by boiling it with soda into diphenylenglycolic acid,  $C_{14}H_{10}O_3$ :—

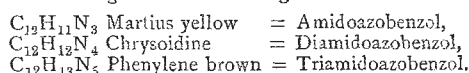


He rejects the former formula of the latter body, because it does not yield by oxidation diphenic acid.—G. Schultz, by passing oil of turpentine through red-hot tubes, has obtained benzol, toluol, xylol, naphthalene, phenanthrene, anthracene, and methylanthracene.—F. Hermann has studied the action of sodium on succinic ether. The product (probably impure succino-succinic ether) yields, treated with potash and with acetic acid, an acid of the composition





while with sulphuric acid it forms a black amorphous mass, which by distillation yields hydrochinone. The product of potash with bromine gives bromanile  $C_6Br_2O_2$ . Air and potash transform the ether into  $C_6H_4O_2(CO_2H)_2$  chinon dicarbonic acid, yellow hair-like crystals.—E. Schunck and H. Roemer, in order to discover traces of alizarine in purpurine, expose the solution to the air until the latter is oxidised, when alizarine, remaining behind unaltered, can be recognised by its absorption-bands in the spectroscopic. The same chemists have found that certain impure purpurines yield a precipitate with alum, which is decomposed by hydrochloric acid with greater difficulty than the purpurine compound. The compound thus obtained forms gold-brown needles fusing at  $231^\circ$  decomposed by heat into carbonic anhydride and purpuroxanthin, and corresponding to the formula of purpuroxanthincarbonic acid  $C_{14}H_8O_4COOH$ .—A. Kern published researches on the action of iodide of methyle on aniline, from which he concludes that only dimethyl-aniline and no monomethyl-aniline is formed in this reaction.—R. Meyer has tried in vain to convert cuminol into cymol; and thinks that former assertions to the contrary depend upon the presence of preformed cymol in cuminol.—M. Muencke (of the firm of Warmbrunn and Quilitz, in Berlin) showed a model of a double aspirator, also a Bunsen burner with a tube to prolong it, and a modification of Fletcher's hot air blast.—G. Gabriel described phenylic and ethylic ethers of tribasic thioformic acid,  $CH(SR)_3$ , obtained by the action of chloroform on the sodium compounds of the corresponding mercaptans.—A. Klobukowsky showed a tube filled with oxide of iron for E. Kopp's method of determining chlorine, bromine, and iodine in organic compounds, and praised the simplicity of this method.—A. Czech and H. Schwebel have found that isocyanide of phenyl and formic acid are formed by the action of dichloroacetic acid on aniline.—A. W. Hofmann showed a new yellowish-red colouring substance called chrysoidine, and established the following remarkable analogies:—



The first body is obtained by the action of nitrous acid on aniline; the third by the action of nitrous acid on phenylene diamine; the new colour (chrysoidine) by the action of phenylene diamine on newly-prepared diazobenzole in alcoholic solution.

## VIENNA

Imperial Academy of Sciences, November 9, 1876.—On parthenogenesis of angiospermous plants, by M. Kerner.—On the shell-glands of Copepoda, by M. Claus.—On a modification of Dumas' method of determination of vapour-densities, by M. Habermann.—Researches on the origin of the lowest organisms, by M. Krasan.—On the action of secondary electric currents on nerves, by M. Heischl.

## PARIS

Academy of Sciences, February 12.—M. Peligot in the chair.—The following papers were read:—Discovery of three small planets, 170, 171, and 172, and of a comet, at Toulouse and Marseilles, by MM. Tisserand and Stephan, communicated by M. Leverrier.—Researches on calorific spectra (continued), by M. Desains. With refracting apparatus of rock salt, the heat accompanying the luminous rays in the solar spectrum is about a third of the total heat; in the spectrum of incandescent platinum it is only a small fraction. Similar results are had with flint apparatus, and M. Desains was unable to make the difference disappear by sending the rays from the metal through layers of water, though this shortened the dark spectrum. But spectra from the electric lamp may be rendered much more like those obtained from the sun's rays. The heat in their luminous part seems to be about one-sixth of the total heat, and if the rays be sent through a layer of water of 3 to 4 cm., the calorific intensity of the dark part is considerably reduced, while the luminous heat is hardly affected; this latter being then about a third of the total heat as in the solar spectrum.—Preliminaries of a study of living and fossil European oaks, compared together, by M. De Saporta. The races most largely distributed in Europe, particularly *Quercus pedunculata*, *sessiliflora*, and *pubescens*, are comparatively recent, though their type is old. In the south of France, at least, these have been preceded by other oaks, that have been partly eliminated, partly confined further southwards.—On a new catalogue of coloured stars, and on the spectrum of Schmidt's star, by P. Secchi. This work is based on Schjellerup's catalogue, published in 1866.—Observations on the *compte rendu* of the *séance* of February 5, 1877, by Gen. Morin. He expressed regret at the omission from *Comptes Rendus* of information given by MM. Wurtz, Pasteur, and Boussingault on certain falsifications of alimentary substances, and urged the importance of the subject, and of chemistry detecting such frauds. M. Pasteur stated that of fourteen cases of preserved peas bought at random in some of the principal quarters of Paris, ten contained copper, sometimes even about  $\frac{1}{10000}$  of the total weight of the preserves, excluding the liquid; which always contains some copper when the peas contain it, but less.—M. Lory was elected correspondent for the section of mineralogy, in place of the late M. Naumann.—On the application of photography to observation of the transit of Venus, by M. Angot. This relates to determination of the instant of contacts.—Practical formulæ of velocities and pressures in arms, by M. Sarrau.—On a class of orthogonal systems, comprising isothermal systems as a particular case, by M. Darboux.—On nitrification by organised ferments, by MM. Schloesing and Müntz. He obtained nitrification by passing ammoniacal waters through a porous substance charged with organic matters, but there was no trace of nitrate from a filter made of pure sand. The active matter, after being subjected to action of chloroform, lost its nitrifying properties exactly as if these special ferments had been killed.—Note on certain alterations of glass, by M. de Luynes. Often, in moist air, fine parallel striae form on the surface, and scales come off, which are found to be of different composition from the glass. Alkalies are almost wholly absent in them, and they consist chiefly of earthy silicate; the proportion of silica rising to 78 per cent., while in normal glass it is only 68. The glass retains its transparency.—On phosphorescent organic bodies, by M. Radziszewski. Hydrobenzamide, amarine, lophine, and the raw product of the action of alcoholic ammonia on benzile show phosphorescence in the dark when brought into contact with an alcoholic solution of caustic potash.—On the fermentation of urine; reply to M. Pasteur, by Prof. Bastian.—On the toxic properties of salts of copper, by M. Bergeron.—Method for recognising iodine in cod-liver oil and experiments on absorption of iodide of potassium by fatty animal matters, by M. Barral. He saponifies the fatty matter with potash, burns the soap, and dissolves in alcohol the iodide of potassium formed. A goat received fifty centigrammes of iodide of potassium daily for eight days with its food. Butter prepared from its milk contained a good deal of iodine. The kid of a goat thus treated being killed, iodine was found in its fat and adipose tissue.—Researches on the history of respiration in fishes, by M. Jobert. He finds a peculiar respiratory system in the Callichthys.—On the transparency of the water of Lake Leman, by M. Forel. He explains the less transparency in summer than in winter, by a stratification of layers of different densities, due to heat on the surface; in winter there is uniform density, and powdery particles either sink to the bottom or rise to the surface.

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